



Future plans

Collaboration
Activities CA, HLT
Package KFParticles

Collaborative work

- We MUST work together, develop common strategies + We have to outreach other communities and broaden the base + keep connection with industry
 - ROOT, Geant, ... but also industry: Intel, ... [Nvidia?](#)
 - Cross representation at diverse workshops & conference
 - ... organize MORE workshops where we invite each other and keep each other's informed
 - ... education, training, ...
- We MUST have standard metrics and consistent measurements to have meaningful comparisons: we need to present and state:
 - relative %tage gain, absolute %tage gain over entire workflows and ALWAYS consider the time to copy data in/out of memory (or specify what enters in the "gain")
 - [Written recommendations?](#) [Self-discipline?](#)
- We may need to test on the same platform
 - Suggested a common test-bed to achieve consistent comparative results?
 - [Ivan suggested a testbed "close by" ...](#)
 - [Experiments seem opened to test their code / framework](#)
 - [Any chance to push this discussion further?](#)

Agreement that adding ROOT and Geant members may be good to keep. Expanding to other experiments is a split feel. It is clear we have a better chance of success with a smaller group first, then expanding with a solid product. Nvidia – why not (but no more reaction). Training was agreed as a good thing to do. Testbed: discussion was on (a) the difficulty of having a generally accessible cluster and set of nodes (easier at FIAS than at GSI) and (b) if ALICE will be testing on a large amount of hardware, it would be nice to share results within this workshop community's participant (similar hardware can be purchased later). Metrics, opinions are split – in one hand should happen by itself but on the other hand, the same questions and puzzles are raised today as many years ago. Ultimately, we may write simple guidance (CUDA folks, I need help).

Common packages

- We have not yet achieved a common software/packages but getting there (CA package, KFParticles, ...)
 - Hope for a common “core” (documentation, coding standards, data structures, interface specification, ...)
 - We should (**MUST**) discuss the long term maintainability and availability of packages
 - Vc, ...
 - Dependencies: OpenCL, ...
 - Keys: Version control + data structure coding & Standards + documentations: the pillar to a good lifecycle
 - Doxygen embedded comments
- Missed: mailing list

Creating a working-group out of those workshops seems to be a good path toward putting a basic support structure for a product. “The product” may be KFParticles at first (and soon). Instead of Ivan and team communicating with individuals, a mailing list would help sharing experience, help each other, sharing information and save all time in the long run. Model of “a small team communicate with individuals on a one to one” is known NOT to scale. We do not need to pro-actively seek other groups to join but openness a plus / a chance for others to follow the activities (Rene, Fons, ..) – Needed: a mailing list, a sourceforge project and repository, Email notices of commit changes, nightly builds and/or regression test suites (overlaps with the idea of a tesbed / several platforms and hardware to compare codes). Documentation a MUST (and could be doxygen based) but also, tutorials. The community would welcome Vc to be integrated into the ROOT project.

From Maksym's talk

- KFPArticles
 - Increase the functionality of the package, create the KFParticle library.
 - Add KFParticle to the STAR experiment and STAR HLT.
 - Further development of the KFParticle package using real data from the ALICE (CERN) and STAR (RHIC) experiments.
 - Implement statistical methods for the particle reconstruction and selection based on KFParticle.
 - Add user code for the physics analysis to KFParticle and help to speed up it.
 - Reconstruct the full topology of the event within KFParticle.
 - Multi vertex events reconstruction with KFParticle.
 - Add adaptive methods (DAF, PDAF, etc.) to the KFParticle package.
 - Use KFParticle for the 4D tracking developing.

The bullets are not ordered. The main focus of KFParticles would be to start with issues of naming convention and common interface ... This would be an ALICE / STAR consolidation (with work in STAR in the next few months). When the “package” is well integrated in STAR and ALICE, then bring back to CBM (standardized) in $\sim 1/2$ year. Some discussion was carried on usage of KFParticles for analysis but there were general resistance (to be addressed at a later time). Later interest in HLTs unclear (and long term).

Next workshop?

- ◉ Topics?
- ◉ More experiments & communities?
 - ◉ ATLAS, CMS, ...
- ◉ Special topic?
 - ◉ Vertexing?
 - ◉ Parallelization strategies?
 - ◉ AOT ...

ATLAS main interest in parallelization of tracking and vertexing techniques so should remain a component. However, if KFParticles converges by then as one package, we may also have a larger component of the discussion on Vertex related issues and move forward with re-importing it into CBM. Also, if VC comes to be included into ROOT, we may have other topics to discuss by the next workshop i.e. the community may have tried and come up with new ideas. Would it then make sense to have the next Workshop at CERN? Should we also consider training as well? General feeling was YES we should on all accounts (Vc training would further expand the base) .